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transferring an amount of said metal alloy, while in said molten state, to a vessel;
cooling said amount of metal alloy in said vessel;
applying an electromagnetic field to said amount of metal alloy for creating a
flow pattern of said metal alloy within said vessel while said cooling continues in order to
create a slurry billet of the desired thixotropic solid to liquid ratio for casting; and
discharging said slurry billet from said vessel, directly and immediately, into a
shot sleeve of a casting machine, without any intermediate stage of holding said slurry
billet between said vessel and said shot sleeve and without any reheating step subsequent
to said discharging from said vessel.

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24. (Amended) A method of producing shaped metal parts from on-demand, semi-solid metal with degenerate dendritic primary solid particles, said method comprising the following steps:

heating a metal until it reaches a molten state;
transferring an amount of said molten metal to a vessel, while controllably
cooling said amount of molten metal in said vessel;
applying an electromagnetic field to said amount of molten metal for creating a
flow pattern of said molten metal within said vessel until a desired molding temperature
within the semi-solid range is reached, thereby creating a slurry of the desired thixotropic
solid to liquid ratio for casting; and
discharging said slurry billet from said vessel, directly and immediately, into a
shot sleeve of a casting machine, without any intermediate stage of holding said slurry
billet between said vessel and said shot sleeve and without any reheating step subsequent
to said discharging from said vessel.

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31. (Amended) A method of producing on-demand, semi-solid material for a casting process, said method comprising the following steps:
heating a metal alloy until it reaches a molten state;
transferring an amount of said metal alloy, while in said molten state, to a vessel;
cooling said amount of metal alloy in said vessel;

applying an electromagnetic field to said amount of metal alloy by the use of a stator for stirring said metal alloy within said vessel while said cooling continues in order to create a slurry billet of the desired thixotropic solid to liquid ratio for casting, a voltage being applied to said stator, the level of said voltage determining the stirring torque applied to said metal alloy;

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changing the voltage level applied to said stator so as to change the stirring torque applied to said metal alloy; and

discharging said slurry billet from said vessel, directly and immediately, into a shot sleeve of a casting machine, without any intermediate stage of holding said slurry billet between said vessel and said shot sleeve and without any reheating step subsequent to said discharging from said vessel.

35. (Amended) A method of producing on-demand, semi-solid material for a casting process, said method comprising the following steps:

heating a metal alloy until it reaches a molten state;

transferring an amount of said metal alloy, while in said molten state, to a vessel;

assembling a covering cap to said vessel in order to permit the use of an inert gas to control contamination;

cooling said amount of metal alloy in said vessel;

applying an electromagnetic field to said amount of metal alloy by the use of a stator for stirring said metal alloy within said vessel while said cooling continues in order to create a slurry billet of the desired thixotropic solid to liquid ratio for casting, a voltage being applied to said stator, the level of said voltage determining the stirring torque applied to said metal alloy; and

discharging said slurry billet from said vessel, directly and immediately, into a shot sleeve of a casting machine, without any intermediate stage of holding said slurry billet between said vessel and said shot sleeve and without any reheating step subsequent to said discharging from said vessel.

37. (Amended) A method of producing on-demand, semi-solid material for a casting process, said method comprising the following steps:

heating a metal alloy until it reaches a molten state;

clamping a thermal jacket around an alloy-receiving vessel;

transferring an amount of said metal alloy, while in said molten state, to said vessel;

cooling said amount of metal alloy in said vessel;

applying an electromagnetic field to said amount of metal alloy for creating a flow pattern of said metal alloy within said vessel while said cooling continues in order to create a slurry billet of the desired thixotropic solid to liquid ratio for casting; and

discharging said slurry billet from said vessel, directly and immediately, into a shot sleeve of a casting machine, without any intermediate stage of holding said slurry billet between said vessel and said shot sleeve and without any reheating step subsequent to said discharging from said vessel.

38. (Amended) A method of producing on-demand, semi-solid material for a casting process, said method comprising the following steps:

heating a metal alloy until it reaches a molten state;

arranging a plurality of stators around an alloy-receiving vessel, said plurality of stators including at least one rotary stator in combination with at least one linear stator;

transferring an amount of said metal alloy, while in said molten state, to said vessel;

cooling said amount of metal alloy in said vessel;

applying an electromagnetic field to said amount of metal alloy for creating a flow pattern of said metal alloy within said vessel while said cooling continues in order to create a slurry billet of the desired thixotropic solid to liquid ratio for casting; and

discharging said slurry billet from said vessel, directly and immediately, into a shot sleeve of a casting machine, without any intermediate stage of holding said slurry billet between said vessel and said shot sleeve and without any reheating step subsequent to said discharging from said vessel.